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July 27, 2001

BOX PCT
Commissioner for Patents
Washington, D.C. 20231

PCT/FR00/00182
-filed January 27, 2000

Re: Application of Thierry PATUREAUX
METHOD AND DEVICE FOR FACILITATING THE FILLING OF VERTICAL TUBES WITH THE AID OF A PARTICULATE MATERIAL
Assignee: TOTAL RAFFINAGE DISTRIBUTION S.A.
Our Ref: Q65504

Dear Sir:

The following documents and fees are submitted herewith in connection with the above application for the purpose of entering the National stage under 35 U.S.C. § 371 and in accordance with Chapter II of the Patent Cooperation Treaty:

☑ an English translation of the International Application.

☑ 3 sheets of drawings.

☑ an English translation of Article 34 amendments.

☑ a Preliminary Amendment

The Declaration and Power of Attorney and Assignment will be submitted at a later date.

It is assumed that copies of the International Application, the International Search Report, the International Preliminary Examination Report, and any Articles 19 and 34 amendments as required by § 371(c) will be supplied directly by the International Bureau, but if further copies are needed, the undersigned can easily provide them upon request.

The Government filing fee is calculated as follows:

Total claims	13	-	20	=		x	$18.00	= $.00
Independent claims	2	-	3	=		x	$80.00	= $.00
Base Fee								$860.00
TOTAL FEE								$860.00

A check for the statutory filing fee of $860.00 is attached. You are also directed and authorized to charge or credit any difference or overpayment to Deposit Account No. 19-4880. The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§ 1.16, 1.17 and 1.492 which may be required during the entire pendency of the application to Deposit Account No. 19-4880. A duplicate copy of this transmittal letter is attached.

Priority is claimed from January 28, 1999 based on French Application No. 99/00945.

Respectfully submitted,

Robert J. Seas, Jr.
Registration No. 21,092

RJS/amt

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Thierry PATUREAUX

Appln. No.: PCT/FR00/00182 Group Art Unit: Not Yet Assigned

Confirmation No.: Not Yet Assigned Examiner: Not Yet Assigned

Filed: July 27, 2001

For: METHOD AND DEVICE FOR FACILITATING THE FILLING OF VERTICAL TUBES WITH THE AID OF A PARTICULATE MATERIAL

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to examination, please amend the above-identified application as follows:

IN THE CLAIMS:

Please enter the following amended claims:

3. Method as set forth in claim 1, characterized by the fact that, as the tube (1) fills up, the cables (4) are brought up more or less in synchronization toward the upper portion of the tube (1).

6. Device as set forth in claim 4, characterized by the fact that the obstacles (5) are arranged more or less symmetrically in relation to the axis of the tube.

7. Device as set forth in claim 4, characterized by the fact that at least some of the obstacles (5) have a rotational symmetry and that their symmetry axis coincides with the axis of their related support.

8. Device as set forth in claim 4, characterized by the fact that at least some of the obstacles (23) have a rotational symmetry and that their symmetry axis is offset in relation to the cable (4).

9. Device as set forth in claim 7, characterized by the fact that the obstacles (5) have a spherical, hemispherical, conical, tronconical or cylindrical shape.

10. Device as set forth in claim 4, characterized by the fact that the obstacles (5) are made of a flexible material, with a damping factor at room temperature and at a frequency of 31 Hz, that is greater than 0.15 and preferably greater than 0.2.

13. Device as set forth in claim 4, characterized by the fact that it contains means for bringing the various cables (4) up toward the upper part of the tube (1), more or less in synchronization, as said tube fills up.

IN THE ABSTRACT

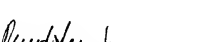
Please insert the following abstract:

The invention relates to a method for facilitating the filling of a vertical tube (1) with the aid of a solid material in a particulate state, whereby the particles move downwards in said tube as a result of gravity and encounter obstacles along the path thereof, whereby said obstacles are supported by at least one cable or similar that is vertically suspended in the tube. According to the invention, the particles encounter at least three obstacles during the fall thereof, whereby said obstacles are disposed in the tube at different levels and are supported by at least two cables (4) that are laterally offset in relation to the axis of the tube.

REMARKS

Entry and consideration of this Amendment is respectfully requested.

Respectfully submitted,



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Date: July 27, 2001

APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claims are amended as follows:

3. Method as set forth in ~~any one of claims 1 and 2~~claim 1, characterized by the fact that, as the tube (1) fills up, the cables (4) are brought up more or less in synchronization toward the upper portion of the tube (1).

6. Device as set forth in ~~any one of claims 4 and 5~~claim 4, characterized by the fact that the obstacles (5) are arranged more or less symmetrically in relation to the axis of the tube.

7. Device as set forth in ~~any one of claims 4 through 6~~claim 4, characterized by the fact that at least some of the obstacles (5) have a rotational symmetry and that their symmetry axis coincides with the axis of their related support.

8. Device as set forth in ~~any one of claims 4 through 6~~claim 4, characterized by the fact that at least some of the obstacles (23) have a rotational symmetry and that their symmetry axis is offset in relation to the cable (4).

9. Device as set forth in ~~any one of claims 7 and 8~~claim 7, characterized by the fact that the obstacles (5) have a spherical, hemispherical, conical, tronconical or cylindrical shape.

10. Device as set forth in ~~any one of claims 4 through 9~~claim 4, characterized by the fact that the obstacles (5) are made of a flexible material, with a damping factor at room temperature and at a frequency of 31 Hz, that is greater than 0.15 and preferably greater than 0.2.

13. Device as set forth in ~~any one of claims 4 through 12~~claim 4, characterized by the fact that it contains means for bringing the various cables (4) up toward the upper part of the tube (1), more or less in synchronization, as said tube fills up.

METHOD AND DEVICE FOR FACILITATING THE FILLING OF VERTICAL TUBES WITH THE AID OF A PARTICULATE MATERIAL

This invention relates to a method and a device intended to facilitate the filling of vertical tubes with the aid of a particulate material, in particular the loading of a chemical reactor's tubes with catalyst particles.

It is to this application of the patent that we will refer most particularly in the remainder of this description, but it will be obvious to the man of the art that the invention is not limited to this use only and that it also applies to the filling of any other type of tube, arranged vertically, with any solid material in a particulate state.

We know that the tubes of a chemical reactor are relatively long, for example in the range of 10 meters, and have a diameter of approximately 10 centimeters.

They are frequently filled with particles of a material that has catalytic properties that are often in the form of small cylinders pierced through their axis, approximately 12 to 16 mm long and with a diameter of 9 to 16 mm.

Filling the reactor's tubes with the aid of such particles is a complex operation as the catalyst has a texture that in general is relatively friable and, when it falls from a certain height, the particles have a tendency to break into many pieces, thus producing a large quantity of fine dry flowables that partially obstruct the tube. The consequence of loading with way is a hydraulic loss that manifests itself by a restriction at the fluid outflow in the tube, thus causing physical perturbations in the reactor's tube, which can for example be detrimental to the metallurgical structure of said tube.

To take care of this serious disadvantage, one suggestion that was made was to arrange, inside the tube to be filled and during loading, obstacles that would hinder the

free passage of particles during their fall, thus slowing them down, to reduce their kinetic energy and prevent them from breaking when they reached the bottom of the tube.

This is how, according to the US patent number 3 608 751, a cable on which are mounted slanted blades is arranged vertically inside a tube to be filled with a catalyst, where the blades slow down the fall of the catalyst particles and the cable is pulled up inside the tube as it fills up.

More recently, the application for the European patent number 0 548 999 has proposed, in a similar manner, to vertically suspend a cable or a chain in a tube that is to be loaded with a particulate material, where this cable or chain supports shock absorbers made of flexible brushes arranged transversally, in order to slow down the fall of the particles without breaking them, and where the cable or chain is, as previously, progressively pulled out of the tube through the top of the latter, as the filling progresses. The flexible brushes are made namely of spring reinforced steel fibers.

Thus these prior techniques to slow down the fall of the particles call upon flexible means of the spring type, that bend under the weight of the particles, thus reducing the speed of their fall. Devices of this type have the disadvantage of being complicated to manufacture as it is necessary to arrange and hold springs around an axis, therefore, they are also expensive to make. Furthermore, while not presenting the same damping ratio over the entire length of the spring, they allow for the passage of some particles, especially when the rate of loading is significant, without these particles ever encountering the means that form the spring, if the latter have just assailed by one or several other particles and have moved away from the position they usually occupy.

Another disadvantage of the flexible means of the spring reinforced steel fibers type previously used is the breaking

of an element of the flexible means that falls to the bottom of the tube, without being able to be removed from the latter until the following unloading of the tube, thus creating a useless hydraulic loss that can be harmful to the proper functioning of the reactor.

This invention relates to methods and devices of the same general type, simple, efficient and not too costly to manufacture, used to break the fall of particles, in particular catalyst particles, when filling a tube arranged vertically, and it is meant to replace the damping systems of the prior technique with parts that are more flexible, making it possible to prevent the breaking of even highly friable particles when they come into contact with them.

With this in mind, the first object of the invention is a method to facilitate the filling of a vertical tube with the aid of a solid material in a particulate state, of the type in which the particles move downward in said tube as a result of gravity and encounter obstacles along the their path, whereby said obstacles are supported by at least one cable or similar device suspended vertically in the tube, and where this method is characterized by the fact that during their fall in the tube, the particles encounter at least three obstacles, that are at least in part laterally offset in relation to the axis of the tube, and where at least two of these obstacles are arranged in the tube at different levels, where the largest dimension of the obstacles, perpendicularly to the axis of the related cable, ranges between 0.25 and 0.75 times the diameter of the tube and said obstacles take up at least 80% of the lateral section of the tube.

Another object of the invention is a device to facilitate the filling of a vertical tube with the aid of a solid material in a particulate state, that moves downward in the tube as a result of gravity, of the type that contains at least one cable or similar device suspended vertically in the tube where this device is characterized by the fact that it is comprised of at least three obstacles, that are at least in part offset laterally in relation to

the axis of the tube, and where at least two of these obstacles are arranged in the tube at different levels, where the largest dimension of the obstacles, perpendicularly to the axis of their related support, ranges between 0.25 and 0.75 times the diameter of the tube, and where said obstacles take up at least 80% of the lateral section of the tube.

To obtain a better distribution of the obstacles in the space made of the inner volume of the tube, the cables are advantageously arranged in the tube in a more or less symmetrical manner in relation to the axis of said tube.

Preferably, more than two cables are used to support the obstacles in the tube and, to create the obstacles related thereto, a flexible material that has the best possible damping ratio is chosen, so as on the one hand to offer a greater probability of encountering the particles to be charged, whatever their rate, and on the other hand, to obtain a homogenous load over the entire section, free of broken catalyst grains and free of fines of these catalysts that would be harmful to the circulation of the fluid.

Preferably each cable is connected to another cable by at least one flexible brace, in such a way that the various cables are correctly distributed in the tube, without any intervention from the operators.

The obstacles supported by certain cables may also touch the contiguous portion of the wall of the tube or its immediate proximity.

Advantageously, the obstacles supported by each cable are arranged at levels that are evenly offset in relation to the obstacles linked to the other cables, in such a way that they are staggered in relation to each other.

As indicated above, the largest dimension of these obstacles, perpendicularly to the related cable, can range between 0.25 and 0.75 times the diameter of the tube,

so that when falling inside the tube, the particles of the material with which we wish to fill said tube must encounter at least one obstacle that will cushion their fall. Of course, the smaller the diameter of the obstacles, the greater the number of cables that support said obstacles.

In practice, each particle will encounter several obstacles that will successively slow it down, without imposing any noticeable shock to it because of the nature of said obstacles and the particles will thus be efficiently slowed down during their journey toward the bottom of the tube.

With the same objective in view, as indicated above, the obstacles arranged in the tube will take up a total of at least 80% of the lateral section of said tube.

Preferably the obstacles have a rotational symmetry around an axis and they can, for example, have a spherical, hemispherical, conical or tronconical or even a cylindrical shape. Their symmetry axis can advantageously coincide with the cable that supports them.

Said obstacles can advantageously be made of an elastomer, in particular a rubber of the isobutylene butyl type, with a damping factor, at room temperature and at a frequency of 31 Hz, greater than 0.15 and preferably than 0.20, or even an alveolate material. To measure this damping factor, we can refer to the work "Criteria for Engineering Design", edited by C. Hepburn and R.J.W. Reynolds, Collection Applied Science Publishers, Ltd, London, and, more specifically to article 2.4 on page 25 of this work: "Design of Elastomers for Sampling Applications".

As the tube fills up, the various cables are preferably lifted up toward the upper part of the tube more or less in synchronization, in such a way that the obstacles they support keep the same relative positions.

The invention thus makes it possible to obtain a homogonous loading of the particles in the tube while minimizing the breaking of the particles and the formation of catalyst fines in the loaded tube.

In a variant of the invention, the cables can be comprised of separate elements that are connected laterally to each other by braces, where the cables

or braces are attached to each other by means of connection known as such, for example with the aid of snap hooks.

According to another variant of the invention, the obstacles' symmetry axes are offset in relation to the axis of the cable that supports them, in the direction of the contiguous wall, specifically when the tube to be filled has an input diameter that is smaller than the internal diameter of the tube.

Other characteristics and advantages of the invention will become apparent in the detailed description that will follow of the various forms of execution of the latter. In this description, we will refer to the attached schematic drawings, in which:

Figure 1 is a schematic elevation drawing of a vertical tube equipped with a device as set forth in the invention,

Figure 2 is a view from above of the tube,

Figure 3 is a view from above the tube with the obstacles with the smallest diameter,

Figures 4, 5 and 6 are schematic views that illustrate various types of obstacles that can be used in the context of the invention,

Figures 7 and 8 are schematic views that illustrate two variants of execution of the invention.

First we will refer to figures 1 and 2.

Tube 1 as represented is a cylindrical vertical tube of significant length, for example a chemical reactor tube and it is equipped in its upper part with a hopper 2, in which are poured particles 3 of a material with which we wish to fill said tube, for example a catalyst.

These particles fall as a result of gravity toward the bottom of the tube 1 and the invention tries to prevent said particles from breaking during their fall, thus producing undesirable dust.

With this end in view, in accordance with the invention, several cables 4, for example steel cables, four cables in the case represented in the drawings, are suspended vertically inside the tube 1, close to the inner wall of the latter, where each cable supports the obstacles 5, in this case in the shape of balls, made of a flexible material capable of cushioning the chocks of the particles, for example an elastomer or a plastic material foam.

In the method of execution represented in figures 1 and 2, the obstacles 5 are in contact with the contiguous portion of the inner wall of the tube 1 and the obstacles of the various cables are evenly offset from each other so as to be staggered.

In this case, the obstacles 5 have a revolution axis that coincides with the axis of the related cable 4 and they can be spherical or not.

The largest diameter, perpendicularly to the related cable, ranges between 0.25 and 0.75 times the diameter of the tube 1, in such a way that a particle of material to be loaded into the tube must encounter at least one of the obstacles 5 when falling in the tube and is thus slowed down in its fall, without necessarily breaking, due to the nature of these obstacles.

In practice, the obstacles supported by each cable are set approximately 50 cm apart from each other, so that, for a long tube, each cable supports many obstacles, thus multiplying, for the particles of filling material, the opportunities to encounter them along their path inside the tube from the top to the bottom, which thus very efficiently breaks their fall inside the tube.

For the same purpose, the obstacles arranged in the tube will take up a total of at least 80% of the lateral section of the tube (see figure 2); this result may also be obtained with multiple obstacles with a smaller diameter

(see figure 3, where the parts described above are designated by the same reference numbers.)

The usual means, not represented, are provided for in order to pull the various cables 4 up in synchronization toward the top of the tube 1, as said tube is being filled.

In the case of figure 1, the obstacles 5 are more or less spherical, but one can use any other form of obstacle that has a rotational symmetry around an axis, for example obstacles 5a with a hemispherical shape (Figure 4), 5b with a conical shape (Figure 5) or 5c a cylindrical shape (Figure 6), whereby naturally this list is not restrictive.

Figure 7 represents a form of execution of the invention in which the obstacles 15, in this case of spherical shape, arranged inside the tube 11, are supported by cables made of a succession of separate elements 14, linked together transversally, at their upper extremity and at the their lower extremity, by braces 16, preferably flexible. The successive sets of cables and braces are connected by means of assembly known in the technique, for example, as represented, by parts of cables 18 and 19, hooked together by systems of snaps hooks 12.

It is not necessary for the obstacles carried by the cables to have a symmetry axis that coincides with the axis of the cable. In the case, in particular, where the tube 21 has on its upper part an entry 22 whose inner diameter is less than that of the tube, as represented in figure 8, it can be advantageous for the obstacles 23, carried by the cables 24 closest to the inside wall of the tube 21, have their symmetry axis offset in direction of this wall, in relation to the axis of the related cable.

The following example of implementation of the invention illustrates the advantages of the device as set forth in the invention for loading a reactor tube.

Example

A reactor tube is loaded successively, with the aid of three different means, of which one is set forth in the invention, with a catalyst in the form of cylindrical particles pierced along their axis, whose physical characteristics are indicated below:

- outside diameter: 16 mm
- length: 18 mm
- inside diameter: 6 mm

The reactor tube used for the test is approximately 7 meters long and its diameter is 100 mm. This diameter is constant over the entire height of the tube.

Three different means of loading the catalyst are used successively in this test:

- by rain effect, in a manner known in itself, to obtain a load as homogenous as possible, where the catalyst is gently poured from the upper extremity of the tube;

- with a system that cushions the fall of the particles that is comprised of small flexible metallic strips arranged evenly around a cable that is disposed along the axis of the tube, where these strips are evenly distributed in the inner space of the tube and arranged approximately every 50 cm on the cable along the entire height of the tube;

- with the device as set forth in the invention consisting of 4 cables that each support 9 obstacles in the shape of balls with a diameter of 40 mm, made of a material of the isobutylene butyl type; where the cables measure 7.20 m and are attached to each other by flexible braces that are arranged approximately every 1 m; the obstacles are distributed evenly over the height of the tube and are offset from one cable to another so as to be staggered within the tube.

Following each loading, the loading density and the percentage of catalyst fines were measured. The results obtained are assembled in the table below.

Table

	Loading		
	By rain effect	With a system of small flexible strips	With a device as set forth in the invention
Density	0.853	0.863	0.865
Fines (%)	1.40	0.50	0.36

We can see from the Table that the loading density obtained with the device as set forth in the invention is more or less identical to that obtained with the system that uses small flexible strips arranged evenly around an axial cable, whereas the quantity of fines that is created (which also includes the possible fragments of catalyst grains) is approximately 1.5 times weaker than that obtained with the small strips loading system.

Furthermore, the device as set forth in the invention makes it possible to obtain a quality of load that is greater than the method that consists in loading the catalyst loosely from the upper extremity of the tube, with an improved loading density and a quantity of fines formed during said loading of approximately 3 to 4 times less than that which results from a loose loading.

CLAIMS

1. Method to facilitate the filling of a vertical tube (1) with the aid of a solid material in a particulate state, of the type in which the particles move down in the tube (1) as a result of gravity and encounter obstacles (5) along the their path, where said obstacles are supported by at least one cable or similar device that is suspended vertically in the tube, where this method is characterized by the fact that during their fall in the tube, the particles encounter at least three obstacles (5) that are at least in part offset laterally in relation to the axis of the tube, and where at least two of these obstacles (5) are arranged in the tube at different levels, where the largest dimension of the obstacles (5), perpendicularly to the axis of the related cable, ranges between 0.25 and 0.75 times the diameter of the tube (1) and said obstacles (5) take up at least 80% of the lateral section of the tube.

2. Method as set forth in claim 1, characterized by the fact that the obstacles (5) are made of a flexible material, capable of cushioning the chock of the particles, with a damping factor greater than 0.15 and preferably greater than 0.2 at room temperature and at a frequency of 31 Hz.

3. Method as set forth in any one of claims 1 and 2, characterized by the fact that, as the tube (1) fills up, the cables (4) are brought up more or less in synchronization toward the upper portion of the tube (1).

4. Device to facilitate the filling of a vertical tube (1) with the aid of a solid material in a particulate state, that moves down in the tube (1) as a result of gravity, of the type that contains at least one cable or similar device that is suspended vertically in the tube, where this device is characterized by the fact that it contains at least three obstacles (5) that are at least in part offset laterally in relation to the axis of the tube, where at least two of these obstacles (5) are arranged in the tube at different levels, where the largest dimension of the obstacles (5), perpendicularly to

the axis of their related support, ranges between 0.25 and 0.75 times the diameter of the tube (1), where said obstacles (5) take up at least 80% of the lateral section of said tube.

5. Device as set forth in claim 4, characterized by the fact that at least two cables (14) are connected by at least one brace (16).

6. Device as set forth in any one of claims 4 and 5, characterized by the fact that the obstacles (5) are arranged more or less symmetrically in relation to the axis of the tube.

7. Device as set forth in any one of claims 4 through 6, characterized by the fact that at least some of the obstacles (5) have a rotational symmetry and that their symmetry axis coincides with the axis of their related support.

8. Device as set forth in any one of claims 4 through 6, characterized by the fact that at least some of the obstacles (23) have a rotational symmetry and that their symmetry axis is offset in relation to the cable (4).

9. Device as set forth in any one of claims 7 and 8, characterized by the fact that the obstacles (5) have a spherical, hemispherical, conical, tronconical or cylindrical shape.

10. Device as set forth in any one of claims 4 through 9, characterized by the fact that the obstacles (5) are made of a flexible material, with a damping factor at room temperature and at a frequency of 31 Hz, that is greater than 0.15 and preferably greater than 0.2.

11. Device as set forth in claim 10, characterized by the fact that the obstacles (5) are made of an elastomer or an alveolar material.

12. Device as set forth in claim 11, characterized by the fact that the flexible material is an isobutylene butyl rubber.

13. Device as set forth in any one of claims 4 through 12, characterized by the fact that it contains means for bringing the various cables (4) up toward the upper part of the tube (1), more or less in synchronization, as said tube fills up.

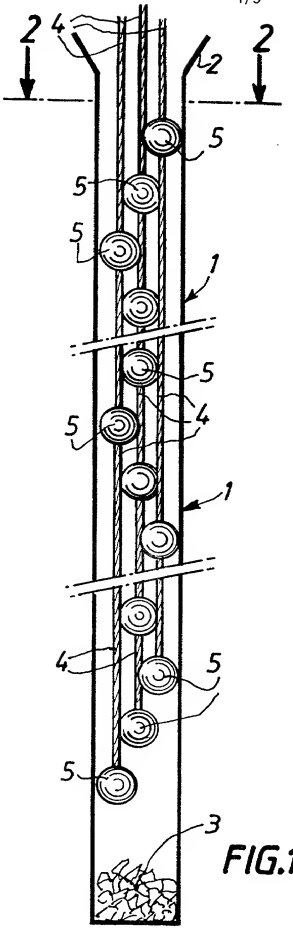

FIG.1

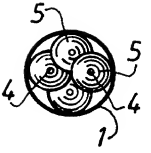

FIG. 2

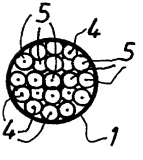

FIG. 3

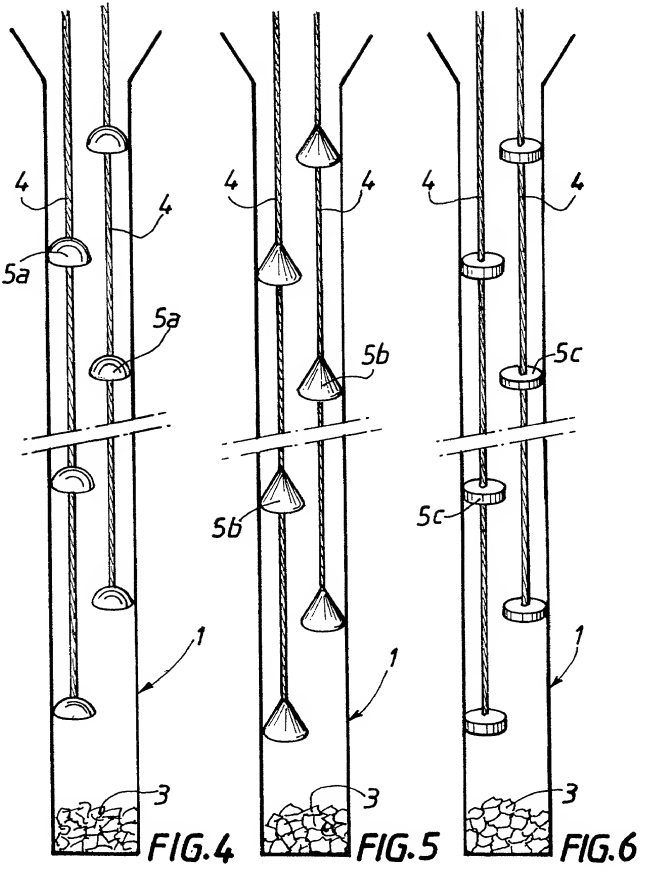

FIG.4 FIG.5 FIG.6

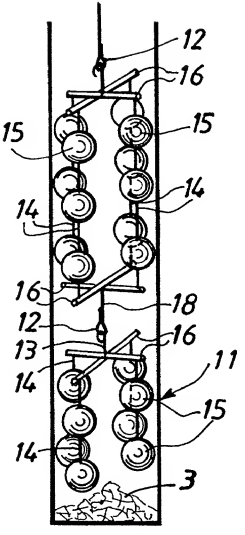

FIG. 7

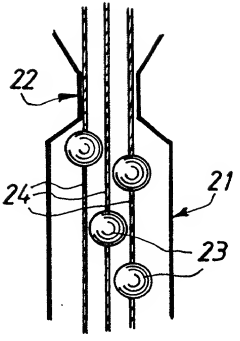

FIG. 8

Declaration and Power of Attorney for Patent Application

Déclaration et Pouvoirs pour Demande de Brevet

French Language Declaration

En tant que l'inventeur nommé ci-après, je déclare par le présent acte que:

As a below named inventor, I hereby declare that:

Mon domicile, mon adresse postale et ma nationalité sont ceux figurant ci-dessous à côté de mon nom.

My residence, post office address and citizenship are as stated next to my name.

Je crois être le premier inventeur original et unique (si un seul nom est mentionné ci-dessous), ou l'un des premiers co-inventeurs originaux (si plusieurs noms sont mentionnés ci-dessous) de l'objet revendiqué, pour lequel une demande de brevet a été déposée concernant l'invention intitulée

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

METHOD AND DEVICE FOR FACILITATING THE FILLING OF VERTICAL TUBES WITH THE AID OF A PARTICULATE MATERIAL

et dont la description est fournie ci-joint à moins que la case suivante n'ait été cochée:

the specification of which is attached hereto unless the following box is checked:

☑ was filed on January 27, 2000
as United States Application Number or PCT International Application Number PCT/FR00/00162
and was amended on
_____ (if applicable).

Je déclare par le présent acte avoir passé en revue et compris le contenu de la description ci-dessus, revendications comprises, telles que modifiées par toute modification dont il aura été fait référence ci-dessus.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

Je reconnais devoir divulguer toute information pertinente à la brevetabilité, comme défini dans le Titre 37, § 1.56 du Code fédéral des réglementations.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

French Language Declaration

Je revendique par le présent acte avoir la priorité étrangère, en vertu du Titre 35, § 119(a)-(d) ou § 365(b) du Code des Etats-Unis, sur toute demande étrangère de brevet ou certificat d'inventeur ou, en vertu du Titre 35, § 365(a) du même Code, sur toute demande internationale PCT designant au moins un pays autre que les Etats-Unis et figurant ci-dessous et, en cochant la case, j'ai aussi indiqué ci-dessous toute demande étrangère de brevet, tout certificat d'inventeur ou toute demande internationale PCT ayant une date de dépôt précédant celle de la demande à propos de laquelle une priorité est revendiquée.

I hereby claim foreign priority under Title 35, United States Code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below, and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Prior foreign application(s) Demande(s) de brevet antérieure(s)			Priority Not Claimed Droit de priorité non revendiqué
99/00945 (Number) (Numéro)	France (Country) (Pays)	January 28, 1999 (Day/Month/Year Filed) (Jour/Mois/Année de dépôt)	☐
(Number) (Numéro)	(Country) (Pays)	(Day/Month/Year Filed) (Jour/Mois/Année de dépôt)	☐

Je revendique par le présent acte tout bénéfice, en vertu du Titre 35, § 119(e) du Code des Etats-Unis, de toute demande de brevet provisoire effectuée aux Etats-Unis et figurant ci-dessous.

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below.

(Application No.) (N° de demande)	(Filing Date) (Date de dépôt)
☐	
(Application No.) (N° de demande)	(Filing Date) (Date de dépôt)

Je revendique par le présent acte tout bénéfice, en vertu du Titre 35, § 120 du Code des Etats-Unis, de toute demande de brevet effectuée aux Etats-Unis, ou en vertu du Titre 35, § 365(c) du même Code, de toute demande internationale PCT désignant les Etats-Unis et figurant ci-dessous et, dans la mesure où l'objet de chacune des revendications de cette demande de brevet n'est pas divulgué dans la demande antérieure américaine ou internationale PCT, en vertu des dispositions du premier paragraphe du Titre 35, § 112 du Code des Etats-Unis, je reconnais devoir divulguer toute information pertinente à la brevetabilité, comme défini dans le Titre 37, § 1.56 du Code fédéral des réglementations, dont j'ai pu disposer entre la date de dépôt de la demande antérieure et la date de dépôt de la demande nationale ou internationale PCT de la présente demande:

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

(Application No.) (N° de demande)	(Filing Date) (Date de dépôt)	(Status)(patented, pending, abandoned) (Statut)(breveté, en cours d'examen, abandonné)
(Application No.) (N° de demande)	(Filing Date) (Date de dépôt)	(Status)(patented, pending, abandoned) (Statut)(breveté, en cours d'examen, abandonné)

Je déclare par le présent acte que toute déclaration ci-incluse est, à ma connaissance, véridique et que toute déclaration formulée à partir de renseignements ou de suppositions est tenue pour véridique; et de plus, que toutes ces déclarations ont été formulées en sachant que toute fausse déclaration volontaire ou son équivalent est passible d'une amende ou d'une incarcération, ou des deux, en vertu de la Section 1001 du Titre 18 du Code des Etats-Unis, et que de telles déclarations volontairement fausses risquent de compromettre la validité de la demande de brevet ou du brevet délivré à partir de celle-ci.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

French Language Declaration

POUVOIRS: En tant que l'inventeur cité, je désigne par la présente l'(les) avocat(s) et/ou agent(s) suivant(s) pour qu'ils poursuive(nt) la procédure de cette demande de brevet et traite(nt) toute affaire s'y rapportant avec l'Office des brevets et des marques: *(mentionner le nom et le numéro d'enregistrement).*

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: *(list name and registration number)*

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Signature du second inventeur Date	Second inventor's signature Date
Domicile	Residence
Nationalité	Citizenship
Adresse postale	Post Office Address

(Fournir les mêmes renseignements et la signature de tout co-inventeur supplémentaire.)

(Supply similar information and signature for third and subsequent joint inventors.)

United States Patent & Trademark Office

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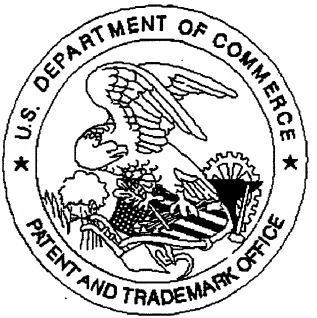

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